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SCIENCE NEWS LETTER

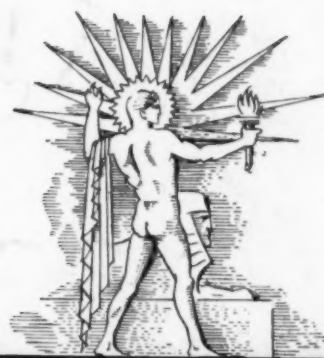
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MAR 24 1941

DETROIT

THE WEEKLY SUMMARY OF CURRENT SCIENCE •



March 22, 1941

For Frequency Control

See Page 179

A SCIENCE SERVICE PUBLICATION

Do You Know?

Migrating birds seldom travel in a straight line.

Fires are often built of *whalebone* in the Aleutian Islands, off Alaska—wood is scarce.

New York State is making a survey and inventory of its *nursing* resources for defense information.

The United States now imports only 5% of its dyes, and exports more of this class of goods than it buys from foreign sources.

Thirty *Comanche Indians* have been chosen by the army for Signal Corps duty, to use their little-known language for code purposes.

Turkey's crops of wheat, barley, rye, and oats in 1940 were the largest in recent years.

British officials deduce from Italian *economic measures* that Italy is short on cereals, fats, charcoal, raw cotton, rubber, leather, and gasoline.

The United States' *population* doubled between 1790 and 1815, again between 1815 and 1840, again from 1840 to 1856, and a fourth time from 1856 to 1900.

A geologist says that Palestine's *mountains* were formed when the sea receded from the area about 500,000,000 years ago; then the sea covered it again for at least 15,000,000 years, and after that the area was dry land again.

QUESTIONS DISCUSSED IN THIS ISSUE

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RADIO

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WILDLIFE

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The Chinese, says an archaeologist, have had sheep since late prehistoric times, but have never developed a *woolen* industry.

Manzanita and wild lilac, growing on the West Coast, are among domestic sources of *burls* offering substitutes for French brier for pipewood.

Toys from the WPA Toy Shop in New York have been placed in Child Health Centers of the city, to amuse children awaiting dental and medical treatment.

By withdrawing *nickel* coins from circulation, Italy has obtained 1,600 metric tons of nickel and expects to salvage another 2,900 tons.

British agriculturists point out that *potatoes* in the ready-to-eat stage can be increased in quantity 33% by care in peeling and eyeing.

Examining bones of a rare fossil *sloth*, Thomas Jefferson in 1796 judged this "an animal of the lion kind" and named it *Megalonyx*, meaning "Great Claw."

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RADIO

Radio Stations' Moving Day Is Coming on March 29

After 3 A.M. on That Date, Most of Your Favorite Stations Will Have New Dial Setting; Push-Buttons Off

See Front Cover

SATURDAY, March 29, will be "moving day" for the country's radio broadcasters.

After 3:00 a. m., on that date, most of your favorite stations will come in at a different dial setting from the one they have had for many years.

If you have a set tuned by push-buttons, they will no longer work properly.

For the radio station engineers, it will mean a good deal of work, and a complete change of at least one small but important part.

The result of all this, however, will be greatly improved reception throughout the nation, especially in rural areas.

Through the Federal Communications Commission, the U. S. government carefully polices the ether. From several monitoring stations in different parts of the nation, they watch all the broadcasters, to make sure that they stay in the band to which they are assigned.

On this account, the stations have taken careful pains to stay where they should be. But beginning on the 29th, almost all will have to make a change. Only those with present frequencies below 740 kilocycles will be unaffected. In most instances, the shifts will be slight, generally a little higher. In a few, however, the jump will be half way around the dial. A station at 1090 kilocycles, as an example, will go to 1310. On the other hand, one at 760 changes only to 770.

A small crystal of quartz, about as big as a lump of sugar, provides the control of frequency at the transmitter. Such a crystal, carefully selected, precisely cut to size, can be made to vibrate so that it yields exact electrical vibrations of any desired frequency. Such a circuit is used to run some of the most accurate clocks.

But the frequency determines the dimensions of the crystal, and that means that each of the 700 stations which will change must get a new one. It might be imagined that some swaps could be effected. A station now on 1190 kilocycles, that has to move to 1210, might

send its crystal to one at 1160, which is changing to 1190. This, unfortunately, is not practicable. The stations are in widely scattered parts of the country. On Friday evening, March 28, they will still be at the old position, with the old crystal still in use. But that evening, you may be sure, they will all have the new equipment ready to change over by the throw of a switch.

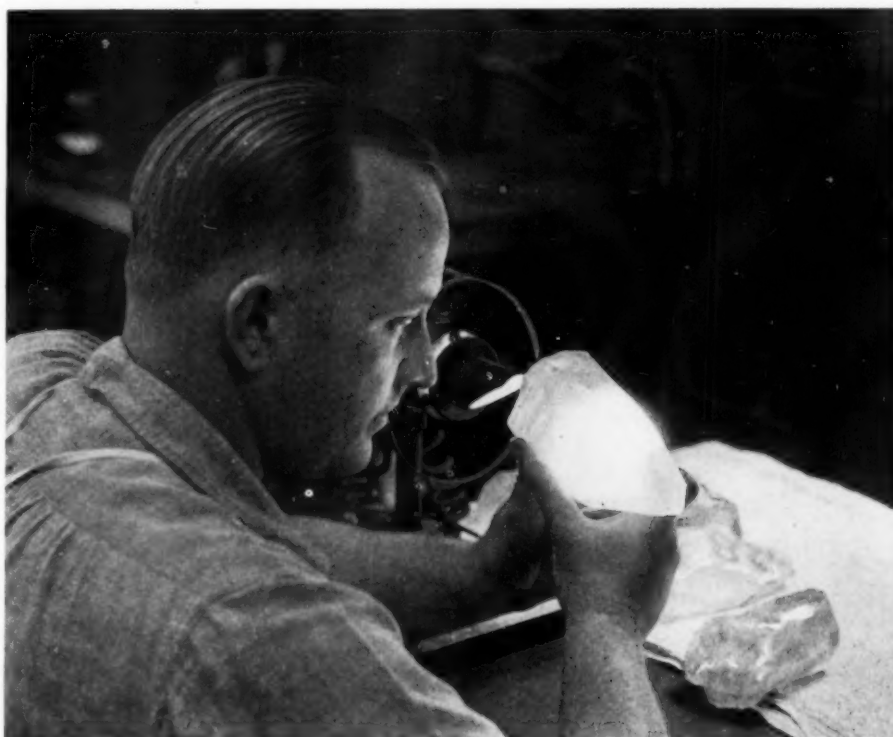
The reason for all this trouble is to improve reception, and as a gesture of good will to our southern neighbors, in Central and South America. Present broadcasting assignments were made in 1928. Then there were no big stations south of the border, so small ones in Latin America could operate freely on

the same channels as U. S. stations. Now they have big ones. Most powerful station in the western hemisphere is in Mexico City. Its power is 350 kilowatts, seven times the 50 kilowatts maximum allowed in the United States.

Some of these stations continued to operate on the same frequency as the U. S. stations, but their higher power interfered with them, except within fifty miles or less of the transmitter. Others tried to slide in between two American stations, but this was even worse. Already as close as practicable for them to be, with channel separations of 10 kilocycles, this meant that two U. S. broadcasters were affected.

To remedy this, an international conference was held in Havana in 1937 and new assignments were harmoniously worked out. Now Canada will have six exclusive channels, Mexico six, Cuba one, and the United States more than 40. In addition, certain channels are shared, where distances between stations are enough to prevent interference.

Changing push-button sets to operate on the new frequencies, is not a diffi-



PRELIMINARY TEST

A crystal of Brazilian quartz, weighing about six pounds, is given a preliminary examination under an arc-lamp by a worker of the General Electric Co. Many defects are thus detected. Perfect sections are ground and the crystals used to control the nation's radio transmitters. Not only broadcasters, but also Army and Navy stations, vital link in national defense, use a great many of them.

cult task. The directions that come with such sets tell in detail how to do it, and generally the only tool required is a screw driver. Mostly, such changes will have to be made after the frequency

shift takes place, otherwise you could not set the buttons accurately. And while you are waiting to make the change, you can tune with the dial.

Science News Letter, March 22, 1941

ASTRONOMY

Astronomers' 1942 Almanac Has Material From Abroad

Information About Saturn Furnished by Germany; France Contributed Data on Jupiter's Satellites

DESPITE the war, foreign governments are still collaborating with the United States in producing the astronomer's bible, *The American Ephemeris and Nautical Almanac*, published each year by the U. S. Naval Observatory, part of the Navy Department.

The *Ephemeris* gives detailed tables of the positions of the sun, moon, planets and bright stars, information about eclipses, lists of observatories and other information that is essential to the astronomer. The volume for 1942 has just been released, so students of the heavens can now, if they wish, make plans for the coming year.

Director of the Nautical Almanac Office is Dr. W. J. Eckert, formerly of Columbia University, who assumed this post last year following the retirement of the former head, Dr. James Robertson.

Writing in the preface to the 1942 volume, Capt. J. F. Hellweg, U.S.N. (retired), superintendent of the Naval Observatory, states that the tables showing the positions of Saturn's rings, and the times when his moons are best seen, were furnished by the *Berliner Jahrbuch*, the corresponding publication of Germany.

The office of the similar French work, the *Connaissance des Temps*, furnished the tables of Jupiter's satellites. From the British *Nautical Almanac* office came tables of the positions of the sun, moon and planets. As in the volume for 1941, however, the name of the Spanish *Almanaque Nautico* is missing. For 1940 they furnished star positions.

Cooperation of the U. S. *Nautical Almanac* with foreign offices was authorized by Congress in the 1912 Naval Appropriation bill. This eliminated much needless duplication of work in the various countries. This act provided,

however, that the work on the *Ephemeris* be so conducted that, in emergency, all the tables needed for the navigation of American ships, both naval and commercial, could be prepared without any foreign assistance. This principle has been carefully followed ever since.

Only two eclipses of the sun are scheduled for 1942, the *Ephemeris* indicates. One is on March 16-17, visible near the South Pole, the other on Sept. 10, near the North Pole. There will be three eclipses of the moon, two partial, and one total, on Aug. 26. This will be seen throughout North America. Also, on a number of occasions during the year, the moon will "eclipse," or occult, the bright star Aldebaran.

Science News Letter, March 22, 1941

MILITARY SCIENCE

Inventions to Widen Arcs Of Fire from Machine Guns

TWO inventions, designed to give machine gunners in warplanes better all-around fire command, have just been granted patents by the U. S. Patent Office.

The first, covered by patent 2,233,642, is the design of John C. Sanders of Seattle. It provides for mounting three machine guns in a vertical zone around the fuselage of a plane. One of the guns is placed directly on the bottom, the other two on the sides near the top, so that the whole circle of the fuselage cross-section is divided equally between them. They can thus be trained so that at least one gun, and sometimes two, has fire command over any enemy approaching from above, beneath, or from either side.

Fore-and-aft command through at least a hemisphere is obtained by mounting each gun in a streamlined "blister" or



GRINDING

Once the correct reference face has been established by X-ray, the crystal, held securely at the base of the adjustable cylinder, is ground to the correct angle on a manually operated grinding spindle.

bulge. The guns lie along the long axis of these bulges when not in use, thereby minimizing the air drag due to projecting barrels and from the more abruptly jutting type of gun turrets now in use.

Each of the three guns may be served by an individual gunner, or, in smaller planes, one gunner may shift from one piece to the other, to meet changes in enemy position. With this system of mounting, the inventor claims, the entire plane is surrounded in a protecting sheath of overlapping fire fields.

Rights in the patent are assigned to the Boeing Aircraft Company.

The other invention, covered by patent 2,233,918, is a design for a nose turret for twin-engine bombers, devised by Howard M. Fey of Portland, Ore. It consists of a sphere made of safety glass or other transparent material, motor-driven to rotate from nearly straight-down to back of straight-up, and through slightly more than a half-circle from side to side.

Within this sphere sits the gunner, his hands and feet on a set of controls like those of a typical airplane. Regardless of what the pilot in his cockpit

above and back of the turret may be doing, the gunner "steers" his turret as if it were a fighter plane, and when his sights bear on his target he fires.

The turret may be armed with either a single light cannon or with one or more machine guns.

Science News Letter, March 22, 1941

GENERAL SCIENCE

Students To Be Deferred If Rated As "Necessary"

Memorandum Sent by Gen. Hershey to State Directors Tells How Cases Should Be Handled by Local Boards

A STUDENT training for any occupation essential to the national health, safety or interests may have his selective service deferred provided the local board finds that student to be a "necessary man," Selective Service Deputy Director Lewis B. Hershey told all state directors in a memorandum just sent to them.

This action was taken in response to recommendations by the National Academy of Sciences and the Subcommittee on Military Affairs of the National Committee on Education and Defense made at the request of Dr. C. A. Dykstra, Director of the Selective Service System.

Educators, scientists, and other interested persons have expressed marked

concern about the status of students in professional, scientific, technical, and other highly specialized fields after July 1, when the group deferment of students provided by the Act expires, Gen. Hershey said.

After July 1, there must be no deviation from the statutory prohibition against group deferments, he warned. But any individual student may be deferred if the local board finds him to be a "necessary man."

In making this decision, the local board should consider each individual case on its own merits. In reclassifying students, all facts in the possession of the local board at the time of the student's classification in I-D or I-E should again be given full consideration, together with any evidence of changed status that may have occurred since classification.

Consideration should be given, the memorandum stated, to such factors as the length of time which the student has been pursuing the course in question, his relative progress and standing in the course, and his relative chances for employment. Contracts of employment or other reasonable assurance that the registrant will engage in an essential activity may be considered as evidence by the local board.

"The intelligent selection or deferment of registrants, as the national interest may require, is the fundamental purpose of the Selective Training and Service Act of 1940 and the Regulations prescribed thereunder," Gen. Hershey's memorandum declared.

"It is clearly the duty and responsibility of the local board to determine the classification of each registrant."

Although deferment in Class II-A may not exceed six months, the deferment may be renewed from time to time if the local board finds that such continuance is justified.

Another step to guard against loss to the nation of the services of qualified professional men was taken by Gen. Hershey in another memorandum to state directors in which he stated that professional students who have completed their course of instructions on July 1, 1941, but who will then be in training or preparation for examinations for license in their professional field, may be deferred for a relatively short period pending the holding of the examination.

Science News Letter, March 22, 1941

GENERAL SCIENCE

Draft Boards Urged to Give Consideration to Students

DRAFT boards are urged to give special consideration to deferment of graduate students in scientific, technological and educational schools and students in engineering and health services, in a resolution just passed by the New York Branch of the American Association of Scientific Workers.

After July 1, the group deferment of students expires, and local draft boards must consider the continued deferment of each student individually on its own merits. A student in these nationally important fields is put into the deferred classification if the local board finds him a "necessary man."

The Scientific Workers urge local

boards to take advantage of information that might be furnished by the National Roster of Scientific and Specialized Personnel and to judge the usefulness of such a student by standards provided in a report made at the request of Dr. C. A. Dykstra, director of the Selective Service System, by the National Academy of Sciences and the Subcommittee on Military Affairs of the National Committee on Education and Defense.

According to this report, defense needs clearly require careful consideration of requests for deferment for students in the following fields:

Medicine, dentistry and pharmacy.



FOR CONTROL

This is the way the crystal section looks after it is ground and ready for use in controlling the frequency of a transmitting station.

Biology, bacteriology and any other branch of biological science which bears directly upon problems of medicine or the public health, safety or interest.

Chemistry.

Physics.

Geology and geophysics, including such specialized fields as meteorology, hydrology and cartography.

Engineering, including civil, electrical, chemical, mechanical, agricultural, sanitary and mining.

"It is generally recognized," the resolution states, "that American democracy depends upon the welfare of its citizens and that this democracy must be safeguarded by an expansion of economic, social, and physical security. These prime requirements of our freedom in turn depend on the full utilization and expansion of our science and technology, our educational system, and our public health services. Our essential resources and services can be maintained only by assuring continuity in the development and utilization of existing personnel and in the adequate training of new personnel.

"However, the conscription, under the Selective Service Act, of the nation's young men for military training, threatens to create a serious dislocation in the country's welfare by disrupting the continuity of their scientific and technical training and service.

"These activities in specialized fields are so rigorous and require such continuous application to keep abreast of current advances that even a year's absence from their pursuit will cause an enormously disproportionate loss in the effectiveness of the training.

"Such loss means lowering the standards of our specialized personnel and will be reflected for many years in its effect upon the educational and public health services and upon the science and technology of our country.

"One of the primary functions of the administration of the Selective Service Act requires that military personnel be developed with a minimum disruption of those spheres of national activity which are of great social value. It is important, therefore, to protect the continuity of the development of professional and technically trained persons."

The New York Branch of the American Association of Scientific Workers requests information regarding the experience of other scientists and organizations in connection with draft problems. The Association's New York Headquarters are at 15 Bank Street.

Science News Letter, March 22, 1941

PSYCHOLOGY

Even Nurture in the Wild Will Not Destroy Intelligence

From Study of Story of Kamala, "Wolf Girl" of India, Psychologist Concludes She Was Not Feeble-Minded

EVEN if a baby is torn away from mother and all human attention, suckled by a wild wolf and taught to run with the pack and eat carrion she is not made feeble-minded by this experience, Dr. Arnold Gesell, director of Yale University's Clinic of Child Development, concludes from study of the story of Kamala, the "Wolf Girl" of India.

Kamala's dramatic life story of a childhood like Kipling's Mowgli in the den of wolves, followed by rescue and care for nine years in an orphanage has been related by a missionary who was in charge of the orphanage, Rev. J. A. L. Singh. It is soon to be published in this country. The story has been examined by Dr. Gesell, who pronounces it "a notable human document."

In the light of his own knowledge of normal child development, Dr. Gesell has analyzed the story of Kamala for evidence of the effects of life in a wolf den on human intelligence and for the light it may throw on the age-old controversy among scientists as to the relative importance of nature and nurture in making an individual bright or dull, genius or idiot. His interpretations are contained in a book *Wolf Child and Human Child*. (Reviewed, SNL, this issue.)

Although Kamala when she died at the age of 17 seemed to have the mental and social development of a child only three and a half years old, she was definitely not feeble-minded, Dr. Gesell concludes. A feeble-minded person is one who because of defective intelligence cannot learn to live independently in his surroundings.

Kamala, according to the story told by Rev. J. A. L. Singh, made not one satisfactory adjustment, but two or perhaps three.

For a few months, she lived the life of a human infant in the rather primitive surroundings of the Indian peasant.

Then, snatched by a she-wolf, little baby Kamala had to learn a new life. She had to compete with wolf cubs for the milk that meant life to her. She had to learn later to run with the pack,

to hunt at night, to recognize the smells and sounds of danger in the wild. Yet the little human babe did not die. She held her own with the wolves and lived and grew. An imbecile could not have fared so well, Dr. Gesell indicates.

But when she was eight years old, even greater demands were made upon her. Now she was taken from the life of the wild and required to learn to walk upright, wear clothing, use the cups and dishes and plumbing of civilized life in the Midnapore orphanage. Her readjustment was slow and tedious, but it was consistent and progressive. And despite the extraordinary delay in learning to walk and talk and do all the things that human babies learn to do, she learned them in the same sequence as does a normal child.

Parents need not fear, Dr. Gesell concludes from the story of Kamala, that the most poorly conducted orphanage in a civilized community could possibly produce feeble-mindedness. It may depress the intelligence quotient as measured by standard tests, it can deprive a child of his cultural rights, but it cannot inflict feeble-mindedness. The human nervous system is more resistant to adversity than that, Dr. Gesell declares.

Stories of children brought up in the wild have long fired the imagination of scientists as well as the public. But few of them have had scientific authentication. Even in the case of Kamala and a foster sister "wolf child" Amala, rescued at the same time, there was unfortunately no opportunity for psychologists or anthropologists to make any examination of these children or of the circumstances of their early life.

Science News Letter, March 22, 1941

War is affecting the orchid business, causing the United States to receive more tropical American orchids, replacing European plants.

Diet should include some foods for vigorous chewing, says a noted nutritionist, explaining that teeth not exercised do not retain a high degree of health.

NUTRITION

Imbalance of B Vitamins Declared Possible Danger

Conclusions Might Affect Food Fortification Program To Improve National Health; Based on Animal Studies

WARNING of possible danger in the food fortification program, planned to improve national health by adding two B vitamins to staple foods, is sounded by Dr. Agnes Fay Morgan, University of California, in a report in *Science*. (March 14)

Health may become worse, instead of better, if the balance of the B vitamins in the diet is upset by adding extra amounts of only two of them, Dr. Morgan believes.

Scientists working in the same field will be shaking their heads when they read this report. It comes just at the moment when their years of effort to have the results of their research applied to improvement of health has culminated in the nation-wide program to add vitamin B₁ and nicotinic acid to bread and flour, to make up for the present de-

ficiency of these vitamins in the national diet.

Dr. Morgan's conclusions are based on diet studies with dogs and are apparently the first, she says, in which dogs have been reared exclusively on crystalline vitamins.

Young dogs which got none of the filtrate fraction of vitamin B, that is, no nicotinic acid, no pantothenic acid, nor any of the so-far unidentified B vitamins, survived, grew moderately well but gradually turned gray and were sedate and elderly in behavior. Giving either nicotinic acid or pantothenic acid to dogs on such deficient vitamin rations resulted in "their gradual loss of neuro-muscular control and sometimes sudden death."

"Attention should be given," Dr.

Morgan concludes from these experiments, "to the possible danger of the administration of large amounts of certain vitamins such as nicotinic acid to persons subsisting on diets having multiple deficiencies. Fortification of foods with those vitamins such as thiamin or nicotinic acid which are available in large quantities may precipitate conditions worse than the subacute deficiency state produced by the usual diet balanced in its inadequacies. Improvement in all directions equally is essential."

Fellow scientists will agree with Dr. Morgan that improvement of diets in all directions is desirable, but will point out that the results of the dog studies should be confirmed by different laboratories before they are applied to human diets.

Science News Letter, March 22, 1941

MILITARY SCIENCE

Sedgley Submachine Gun Lighter Than German One

ANOTHER new submachine gun, the invention of R. F. Sedgley of Philadelphia, has been added to the growing list of fast-firing short-range weapons made popular by the success of Germany's "blitz" campaign last spring.

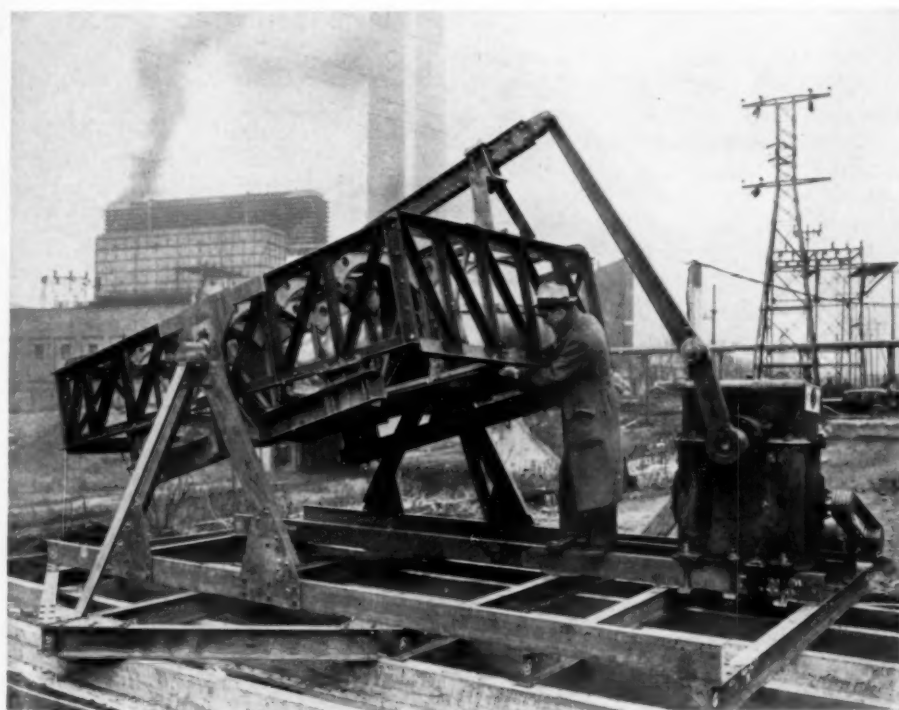
Like the weapon used by the Nazi motorcycle troops, the Sedgley is bored for 9-millimeter (.354 caliber) pistol cartridges, fed in box clips of 20. It surpasses the German submachine gun, however, in weighing only 7.5 pounds as against the German weapon's 9.35 pounds, although the barrel on the American military model is three inches longer.

The Sedgley also is very simple in construction, having but four moving parts. It can be fired one shot at a time, or in bursts of full automatic fire.

Commenting editorially on the adoption of a lighter caliber than the .45 popularized by the "Tommy gun," prototype of all present-day submachine guns, *Army Ordnance*, (March-April), decidedly favors the retention of the heavier caliber bullet, because of its greater remaining energy at moderate ranges, and especially because of its high shocking power at any range within which its fire is effective.

Science News Letter, March 22, 1941

The 10-passenger monoplane used by Admiral Richard E. Byrd in surveying 100,000 square miles of Antarctic ice in 1939, has been given anonymously to the University of California for use in training engineering students.



SLOSH TESTER

This huge rocker simulates some of the stresses and strains imposed on an airplane's fuel tank by the force of sloshing fuel. Here a B. F. Goodrich Company engineer is shown examining a 425-gallon capacity self-sealing tank following a 25-hour test.

ANTHROPOLOGY

"Uncle Sam's" Nose is Not Typically American

UNCLE SAM'S nose, as drawn by most cartoonists nowadays, is not typically American, declares Dr. Ales Hrdlicka, Smithsonian Institution anthropologist. That decidedly curved beak may be all right on the old gentleman's favorite bird, but it isn't right on his own countenance.

Dr. Hrdlicka has measured hundreds of "Old American" heads—people whose forebears have been in this country for several generations and whose ancestors were mostly Anglo-Saxon. He has found that most of their noses are either straight or only slightly convex. Almost never, the veteran anthropologist declares, has he encountered an "Uncle Sam nose" on an "Old American" face.

Science News Letter, March 22, 1941

CHEMISTRY

English Firm Making Textile from Seaweed

NEWEST raw material from which synthetic textiles can be manufactured is seaweed, according to a report to the American Chemical Society from a British correspondent.

Details have just been disclosed in England, it is revealed, by Prof. J. B. Speakman, who has been carrying on researches during the past two years for a British firm. The name of the company is not given, because, it is said, "it has not yet attained large-scale production of the new product and does not wish to be asked for samples at this stage."

In former years, seaweed was collected in the Hebrides to the extent of 400,000 tons annually, it was stated. Far larger amounts are available from the west coasts of Scotland and Ireland as a whole, so the raw material is abundant and should be very cheap.

From the seaweed is extracted alginic acid, which makes up about 20 to 30 per cent of the dried seaweed. This can be dissolved and then spun in a solution of acid, through spinnerettes like those used in making rayon.

Such fibers, spun in acid, dissolve in soap and soda solutions, and hence are useless as textiles. The alginic acid can, however, be combined with inorganic material in the form of compounds called alginates. These are resistant to alkalis, and constitute the new fibers.

They have good luster and strength, and are non-inflammable. In fact, it is said, the fabric can be soaked in gasoline, the latter ignited and burned away, leaving the fabric the same as before this treatment. It costs less to make than viscose rayon, says the report.

Science News Letter, March 22, 1941

MEDICINE

Blood for Transfusions Subject to Sales Tax

TAX collectors have often been called bloodsuckers, sometimes in jest and sometimes in earnest. Now they are taxing blood itself.

New regulations issued by the sales, service and use tax division of the Colorado state treasurer's office decree:

"Blood is in some instances obtained, classified, stored and sold in a manner similar to other items of tangible personal property, by what are usually termed 'blood banks.'

"Where this item is handled in this manner and dealt with at a definite commercial price, and purchased from a person or persons engaged in the business of selling such item, the sale shall be deemed to be the sale of tangible personal property, and subject to the sales tax."

The Colorado sales tax is 2%.

Blood passed directly from donor to receiver is not taxed. As the Colorado service tax originally stood, it might have been, but in 1938 the Legislature, due to protests against collection of the service tax on humanitarian services, repealed it so far as those services are concerned.

Science News Letter, March 22, 1941

PHOTOGRAPHY

Device for Copying Books Photographs on Paper

IN a recently patented device for copying from books, two opposite pages can be reproduced simultaneously. Sheets of photographic paper are placed with the emulsion in contact with the pages, these are put in the device which has spring fingers to hold the pages and paper against the glass top and side of the cabinet. Then lights operate inside to make the exposure. No lenses are used, but the result is a negative print, since the black ink of the printing reflects less light back to the emulsion than the white paper, and the exposure is less. (*Patent 2,227,850, Luma, Inc., Pittsburgh.*)

Science News Letter, March 22, 1941

IN SCIENCE

PSYCHOLOGY

Defense Work Does Not Stop Englishman's Tea

EVEN the rush of war work is not enough to keep the Englishman from his tea, judging by an advertisement in *Flight*, (Feb. 6). Among the advertisements for metal work, aluminum castings and other material and equipment used in airplane construction is one for a boiler to be used in the shop from which can be obtained water for tea!

"You'll never get a better cup of tea than you will if it's made on the spot from freshly boiling water," the announcement promises. "Taking the men to tea, or the tea to the men, are equally wrong. Making it where they work is the only sensible way—and for this you need a So-and-so Boiler."

Science News Letter, March 22, 1941

GENERAL SCIENCE

Science Books Reach New Peak in U. S.

BREAKING all quantity production records for the United States in scientific and technological books, publishers turned out 3,432,642 volumes in 1939, the Bureau of the Census has just reported, from figures it has compiled on the latest Census of Manufactures.

This peak record represents an increase of more than a million books on science and technology over the previous manufactures census, of 1937. Added to these might be over 1,868,000 books on medicine, 1,018,000 books on agriculture, and many other books which overlap into the science and technology class, but are in another Census Bureau classification.

There has been a steady increase in books on science and technology in the United States for the past decade, Census officials find.

Still the best seller in America, however, is the Bible, which in 1939 reached a production figure of 7,927,848 volumes. This includes entire Bibles, separate Testaments, and portions of the Bible published in separate covers.

Science News Letter, March 22, 1941

WILDLIFE FIELDS

FORESTRY

New Electric Method Estimates Health of Trees

TREE surgeons now have available an instrument that will do for them what the stethoscope does for the doctors who safeguard the health of humans—make a quick estimate of what's going on inside.

The new method is a result of the discovery, by Thaddeus Parr of the U. S. Department of Agriculture, that there is a slight difference in electrical potential between top and root of a tree. During the time of fastest growth in spring, this gradient is from top to root; later, it reverses its direction. But in a tree seriously injured by insects or otherwise in bad health, the reaction is abnormal, being either weaker than in a sound tree or reversed in direction.

A comparatively simple but very sensitive voltmeter has been developed, that can be carried into the woods, so that field diagnoses will be readily possible by foresters, entomologists and others who have been trained in its use.

Science News Letter, March 22, 1941

WILDLIFE

Device Removes Swallowed Shot from Ducks' Gizzards

WILD ducks are saved from death by lead poisoning with a device invented by Warren H. Nord of the Minnesota Agricultural Experiment Station here. Mr. Nord's device, which works somewhat on the principle of the stomach pump used in human medicine, will be described in the *Journal of Wildlife Management*, (April).

Wild ducks frequently shovel up shot pellets that have fallen into the water, in the course of their grubbing for food on the bottom. The pellets are retained in their gizzards like small stones, and in time may cause lead poisoning. Serious wildfowl losses have been traced to this cause in recent years.

Mr. Nord's lifesaver for sick ducks consists of two tubes of Pyrex glass, one within the other. The tip of the

inner tube projects slightly beyond the end of the outer one, and is bent over just enough so that its opening is parallel with one side instead of straight across the end.

For operation, the sick duck is laid on its back, with its wings and feet held to prevent it from struggling. The tube is carefully pushed down its esophagus and into the gizzard. A trickle of water is flowed through, in the annular space between the two tubes. This loosens the contents of the gizzard, which are then drawn out through the inner tube, by means of a slight vacuum produced by an aspirator attached to a laboratory faucet.

There is no difficulty in catching lead-poisoned ducks. They are just too sick to fly. The operation, of course, is not particularly relished by the ducks which naturally do not understand what is going on. But it does bring out the poisonous leaden pellets. And Mr. Nord figures it is better for the ducks to be uncomfortable for a few minutes than to be permanently dead.

Science News Letter, March 22, 1941

ASTRONOMY

Sun's Hydrogen To Last 10,000,000,000 Years

ABOUT 10,000,000,000 years from now, the sun's supply of hydrogen, the fuel that keeps it going, will be used up.

So declared Prof. Augustus H. Fox, of Union College, in an address before the local chapter of Sigma Xi, national honorary scientific fraternity.

In the past history of the sun, estimated at two billion years, he said, only about one per cent of the fuel supply has been consumed. As its hydrogen content diminishes, however, the rate of consumption increases, along with the temperature. On the sun's surface the temperature is about 11,000 degrees Fahrenheit, but at the interior, where the hydrogen is consumed, it reaches many millions of degrees.

The current theory of the origin of the energy of the sun and other stars, on which these calculations are based, said Prof. Fox, is that there is a chain reaction between the nuclei of the atoms, with gaseous carbon and nitrogen acting as catalyzers. These are substances that, at the end of a reaction which they stimulate, revert to their original form. In the process, hydrogen is changed to helium, with the liberation of energy.

Science News Letter, March 22, 1941

MEDICINE

Male Sex Hormone "Banks" Relieve Uterine Tumors

"BANKS" of male sex hormone pellets implanted in the thigh muscles of women with tumors of the uterus relieved bleeding, discomfort and other symptoms, Dr. Robert E. Greenblatt and Dr. Everard A. Wilcox, of the University of Georgia School of Medicine, reported at the Southeastern Surgical Congress in Richmond.

The treatment does not constitute a cure but is recommended by the Georgia doctors for patients in whom operation to remove the tumor is either not feasible or desirable.

No signs of masculinization appeared in any of the women given the hormone banks or receiving the pure male sex hormone by mouth or by injections under the skin.

The control of the bleeding by the male sex hormone treatment proves, the doctors believe, that this symptom could not have been due to mechanical factors or to the tumor itself but was a result of the associated glandular imbalance.

When treatment was stopped, bleeding and other symptoms recurred. The growth of the tumors, however, was apparently held in abeyance by the treatment. Some women volunteered the information that the tumors seemed to them to have grown smaller.

Science News Letter, March 22, 1941

CHEMISTRY

Transparent Plastic Knife Not Harmed by Fruit Acids

A KNIFE for such uses as cutting vegetables, fruit and cake is made of transparent plastic. When it is dull, it can be resharpened with an ordinary paring knife. It is not affected by fruit acids, and the same resistance prevents tarnishing. (*Plastics Creations, Atlantic City.*)

Science News Letter, March 22, 1941

PHYSICS

Rubber for Gasoline Hose Is Electrically Conductive

RUBBER that is electrically conductive is now available. It is used in gasoline hose, airplane de-icers and other parts to carry away charges of static electricity that might spark and cause fire and explosion. (*Goodrich Tire and Rubber Co.*)

Science News Letter, March 22, 1941

CHEMISTRY

Plastic Packages

Research Brings Attractive New Transparent Wrappings To Replace Glass; Early American Theme for Some

By WATSON DAVIS

OIL IN a plastic bottle.

Augers and clothes line in transparent revealing dress.

Fresh carrots packaged in almost invisible bags.

Medical tablet tins that flip open at the press of your thumb.

These and some 30,000 other new kinds of packages, about to parade in our stores by the millions, are the packaging industry's offering to the American public this year.

Each spring leading designers and manufacturers and users of the new boxes, bags, bottles, jars and other containers place their best and most novel products on display. You will see them in your home or upon store shelves.

Scientific research aids packaging prog-

ress by producing new materials or applications and inventing clever ways to make the packaging of merchandise better, more convenient, more attractive and more economical.

Transparent wrappings and containers for almost everything from silver to cheese have been made possible by the application of new materials to the problems of packaging. Showing the article and yet protecting it has become a prevailing mode.

Replacing glass containers that are costly to ship and may break, lubricating oil is now sold in transparent, unbreakable plastic bottles. Even the label is transparent, consisting of a cellulose acetate sheet that is pressed into the plastic oil-can's shell to become a part of it. Designed primarily for sportsmen, the new oil dispenser is only a fifth the weight

of the glass bottle previously used.

Hanks of clothes line are now housed in cellulose bags that do not conceal the merchandise but keep it clean. One trick in this new package is that two 50-foot hanks are connected by a strand of the rope and the clerk can sell a continuous 100-feet or give the customer 50 feet by a snip of the shears.

Carpenters and amateur handymen about the house can see the auger bits they are buying when they are packaged in transparent cellulose capsules, instead of the old-fashioned brown paper wrappings or wooden boxes.

Carrots, garden-fresh, are now being furnished the housewife in sanitary pre-packed containers of transparent sheeting made from a rubber derivative. These moisture-tight bags can be re-used in the refrigerator for wrapping other food.

The latest kind of silver chest is made of a transparent plastic material so that the shiny ware can be displayed in store and home and be admired.

A prize-winning package of several years ago was transparent rubber hydrochloride sheeting for containing processed cheese. This year the same general method is being applied to wrapping natural cheese that heretofore has been marketed in bulk "wheels" familiar in the delicatessen showcase. There is no rind or dried surface.

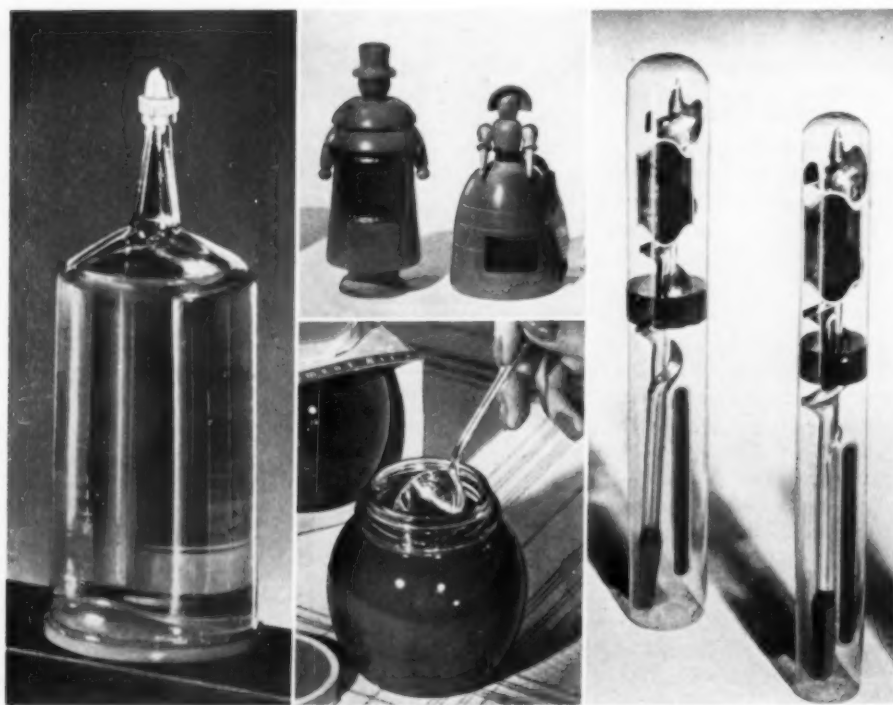
Sliced Through Wrapping

Cheese also appears in colorless wax and cellophane dress ready for table use, with size of the pieces such that it can be sliced through the wrapping right at the table.

The latest development in tin containers is the flat box that opens with a press of the thumb, not the breaking of a fingernail. Wire hinges are replaced by a lug arrangement that securely attaches the top to the base and allows finger pressure at the back of the box to open it. It is used to pack medical tablets.

Soiled hands in the interest of white shoes are prevented by a new dispensing closure for shoe cleaner. Instead of the mussy sponge, the bottle has a fiber-covered rubber top with which the white stuff is applied directly to the shoe.

Manicure cosmetics for making nails colorful now come in collapsible tubes with brush or felt self-applicator tops in-



GLAMOUR ON THE COUNTER

Oil now comes in a transparent plastic bottle (left) that is unbreakable and reveals the contents. Wooden containers for cosmetics (center above) represent "the Governor" and old "Miss Boston." Catsup is packed in a jar (center below) to eliminate bottle-thumping. In transparent capsules, (right) auger bits are protected, yet they can easily be examined.

stead of ordinary bottles. A press of the tube allows the enamel or other material to flow on the nails without muss or leakage.

Molded plastics of brilliant colors replace the aluminum previously used on a popular double-capped shaving stick, incidentally saving aluminum for defense.

Wooden figures of "Miss Boston" and the "Governor" of old New England, as well as jugs, maple sugar kettles, butter churns and other characteristic shapes, are used to package one brand of toilettries. Still other products show the return to early American tradition in the design of their containers.

No More Pounding

Pounding the bottom of a long-necked catsup bottle is no longer necessary because a new design makes the catsup and chili sauce container a wide-mouthed, low center of gravity jar from which the red sauce can be ladled with a spoon.

Every tobacco tin becomes its own humidifier in a new pound smoking mixture container. Into the inside of the knob on the lid the user inserts a small, moistened sponge.

Wire staples of new design are used to fasten buttons on sales and display cards. Old method was to sew them on. The staples are cheaper and buttons can be removed one at a time instead of all of them coming loose when the first is used.

Even the familiar glass milk bottle has been beautified and reshaped in the interests of better service. It is a quarter lighter (weight saving of 5 ounces) and 10 per cent shorter to fit more easily in the refrigerator.

A new toilet paper container holding 21 rolls is attractively decorated and when emptied turns into a waste basket for the home.

Rubber toy soldiers march out upon a cardboard stage provided by a new display package which more than tripled the sales of this product.

Jars, crocks and kitchen utensils of America's early days are copied in the crockery and earthenware packages being used to market savories such as conserves, fish chowder, puddings, and tea. These packages are used on the dinner table long after their original contents have been eaten.

Containers of cosmetics and shaving preparations for men are based on a little jug found in the tomb of an Egyptian pharaoh, and its dress is Scotch, authentically patterned after the highland tradition.



EARLY AMERICAN

Conserves and other old-fashioned savories are packed in jars that recall early American crockery.

Among the other displays that have won awards in the 10th Annual All-American Package Competition, sponsored by Modern Packaging Magazine, New York, are displays that attract the attention of purchasers to the goods that they want.

One display being used in drug stores for medical products glows attractively without any light source within it. The reason is that fluorescent materials are incorporated in the plastic material of which the display stand is made. The ultraviolet radiation in daylight or arti-

ficial lighting is converted into luminous glow that suffuses the whole fixture.

One display for oil at filling stations uses an old auto tire to make it heavy enough to stay put in wind or rough handling. A beer display became more effective when a real handkerchief was used to wipe the overheated brow of the man reaching for a glass.

Leaders of the package industry will gather at Chicago early in April when the awards of the competition will be presented.

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ANTHROPOLOGY-MEDICINE

Israelites of Bible Credited With High Skill in Medicine

ISRAELITES of the Bible had vast medical knowledge for their time, and were deeply steeped in Egypt's medical lore, Prof. Abraham S. E. Yahuda, formerly teacher of Hebrew Literature in the University of Madrid, told a lecture audience at the New York Academy of Medicine.

The vivid description of Biblical leprosy in Leviticus 13 and the curses of fever, itch and assorted ills in Deuteronomy 28 were cited by Prof. Yahuda as examples that could have been written

only by a person perfectly acquainted with ancient Egyptian medical practices and terminology. The medical descriptions, he said, add strength to the traditional view that Moses wrote the first five books of the Old Testament, the Pentateuch, about the time when the Israelites made their Exodus flight from Egypt.

Study of the medical references, he emphasized, refutes the contention of some Biblical critics that Hebrew medical knowledge in that time was "small



SAFE

Children's toys are now made of rubber, which won't scratch furniture, and are packed in a box which serves as a miniature stage.

in amount and crude in character".

Some of the Hebrew expressions are literal translations from Egyptian technical terms used in medicine, he pointed out. On the other hand, there are Egyptian medical expressions which have puzzled Egyptologists, but which can be explained from their Hebrew equivalents. Prof. Yahuda added that Hebrew terms for boils, blains, eczemas, tumors, scurvy, scabs and treatment of sick were formed from roots exactly corresponding to Egyptian stems from which names of febrile skin diseases and therapeutic terms were derived.

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Books

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CHEMISTRY

Important Explosives Chemical Can Be Made From Petroleum

GLYCERINE, important industrial chemical used in the manufacture of explosives for America's defense program as well as in more peaceful pursuits such as the manufacture of resins for varnishes and lacquers and the processing of tobacco, can now be made from petroleum.

Members of the American Institute of Chemical Engineers, meeting in New Orleans, heard Dr. E. C. Williams, vice-president and director of research of the Shell Development Co., Emeryville, Calif., describe the new process.

At present obtained as a by-product from the soap and fat splitting industry, the price and supply of glycerine has been subject to wide variations. In 1917 it rose to 70 cents per pound and was difficult to obtain even at that figure. At that time it was made in Germany by a fermentation process, to the extent of about 13,000 tons annually, but this

method involved many commercial difficulties.

First step in the Shell process is the isolation of a gas, propylene, from the petroleum. Then comes a reaction with chlorine gas to form allyl chloride. This is treated with caustic soda to form allyl alcohol. In an alternate step, glycerine chlorhydrin is formed instead. The last step is the production of glycerine from one of the last two products.

In explosives manufacture, the glycerine is treated with nitric acid to form nitroglycerine. This is used to make dynamite and also some military explosives. The British explosive, cordite, also requires glycerine in its production.

Dr. Williams declared that the glycerine produced by the new method "is of excellent quality, meeting easily the specifications of the most rigorous user with whom we have yet come in contact."

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MEDICINE

Enzyme That Darkens Potatoes May Aid High Blood Pressure

DISCOVERY that a common enzyme, familiar for its part in causing potatoes to darken, will reduce dangerously high blood pressure in human patients and clear up the eye and heart symptoms in high blood pressure is announced by Dr. Henry A. Schroeder, of the Hospital of the Rockefeller Institute in New York. (*Science*, Jan. 31.)

The name of the enzyme is tyrosinase. It is found in many fruits and vegetables, for example, apples, mushrooms and bananas, as well as potatoes, and also in human and other animal tissues. Dr. Schroeder used tyrosinase from mushrooms, but a mushroom diet is not therefore to be considered a cure for high blood pressure.

A pure preparation of tyrosinase was injected under the skin of 17 high blood pressure patients daily for from three to four weeks. In all but one, Dr. Schroeder reports, "the blood pressure fell a significant amount." Even patients in a late stage of the disease were improved.

Tyrosinase may be the long-sought

curative remedy for high blood pressure, but Dr. Schroeder does not think so, although he does not know yet. He is still working on the problem, trying to find out whether tyrosinase will prove to be a cure for high blood pressure or whether following this clew in further research will lead to discovery of another more effective chemical.

Reduction of high blood pressure and relief of other symptoms of the condition in small groups of patients have been accomplished by other scientists by the use of kidney extracts. Tyrosinase, which is found in animal as well as plant tissues, might be the active principle of these extracts, Dr. Schroeder said, but he does not think it is. The exact chemical composition of the kidney extract, however, is still unknown.

When he stopped giving tyrosinase to his patients, their blood pressure returned to its previous high level within three to six days, Dr. Schroeder reports. Improvement in the other symptoms and in the eye condition lasted longer.

Tyrosinase was tried, first in rats and dogs and then in human patients, as a possible high blood pressure remedy because Dr. Schroeder believed the substance responsible for some varieties of high blood pressure may be a chemical

containing a phenolic group. This chemical group can be broken down by the mushroom enzyme. The results suggest, he says, "that some phenolic substance is altered."

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PALEOBOTANY

Ethiopian Climate Now Like Arizona's Long Ago

Forests in Early Dinosaurian Days Were Dominated By Great Tree Ferns and Relatives of Conifers

CLIMATIC conditions like those in parts of modern Ethiopia prevailed in the American Southwest 170 million years ago, when the long reign of the dinosaurs and their great reptilian kin was just beginning. This is indicated by fossil plant remains in one part of Petrified Forest National Monument in Arizona, studied by Dr. Lyman H. Daugherty of San Jose State College in California. Dr. Daugherty's report has just been published by the Carnegie Institution of Washington, along with a description of the geology of the region by Howard R. Stagner of the U. S. National Park Service.

The forests of Arizona in early dinosaurian days (Triassic, to geologists) were dominated by great tree ferns and relatives of modern conifers, Dr. Daugherty states. Higher flowering plants of the broad-leaved types were not to make their appearance for many millions of years. However, plant evolution was going on quite rapidly, as the saurians lumbered onto the scene.

Presence of tree ferns argues a warmer climate than that of present-day Arizona;

it was a warm-temperate or subtropical world. Conifer tree trunks show very sharply marked annual rings, indicating an abundance of rain during part of the year, followed by a severe dry season in which no growth took place. Great size of the petrified logs indicates a climate far better suited for tree growth than is the present climate of the Southwest.

Dr. Daugherty has come to the conclusion that in Triassic Arizona there were moist stream valleys with thick, jungle-like forests, the plateaus between them supporting lower vegetation with scattered trees. This kind of formation, called savanna by ecologists, is characteristic of parts of Ethiopia and other regions in Africa, as well as certain areas on the outskirts of the great central tropical forest mass in South America.

Evidence of forest fires in the ancient woods was turned in the form of boat-shaped log fragments crusted with fossil charcoal. However, no healed-over fire scars have been found, to indicate that trees suffered fire injury while living.

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archaeologists, have pursued this digging project at intervals. Road construction in northern suburban Jerusalem offered the present good chance to inspect hidden depths of the city's past.

Digging in progress has revealed the foundation course of a wall and tower to the east of a modern American landmark in Jerusalem—the American School for Oriental Research.

Every foot of the buried walls of Jerusalem added to the map picture of the past is eagerly hailed by scholars because of arguments over true location of venerated sites. Especially keen is interest over the location of Jesus' tomb, which Biblical narrative places outside the city gate.

Discoveries of wall fragments in recent years have convinced some archaeologists that the famous Church of the Holy Sepulchre cannot be the site of Jesus' tomb, because they reconstructed the lines in such directions that the church would stand inside, not outside, the old Second Wall—the wall of Jesus' day.

The Church of the Holy Sepulchre owes its veneration to events in the fourth century when Emperor Constantine and his mother, Helena, took great interest in sites and relics relating to Christ and the location of the tomb was fixed where church and shrine stand.

Unearthing even a fragment of tower

ARCHAEOLOGY

Parts of Jerusalem's Third Wall Revealed at Last

WAR or no war, two archaeologists in Jerusalem are now methodically digging to clear up remaining mysteries concerning the Holy City's historic and controversial Third Wall.

This is the wall built by Herod Agrippa not many years after the death of Christ. St. Paul viewed this new and ambitious wall enclosing Jerusalem, in

the days when boldness of building such a fortification aroused suspicion that Jewish King Agrippa planned a revolt against Rome.

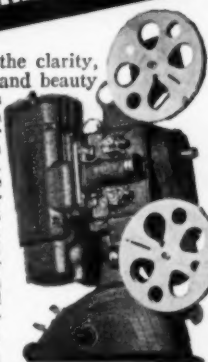
Starting last August, Professors E. L. Sukenik and L. A. Mayer of the Hebrew University resumed their investigation of the route of this long-buried Third Wall. Since 1925, these two, assisted by other

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or stone course of ancient Jerusalem wall is a triumph for archaeology, for the city is a difficult one in which to make arrangements for archaeological digging, the walls are much damaged and broken in line, and the various enlargements of the city by new wall-building were not simple additions of a new and encircling barrier. The additions spread mainly

northward, expanding the city in that direction.

American archaeologists are literally on the ground where the Third Wall is being revealed, for the grounds of the American School of Oriental Research are crossed by the northern boundary line of this long-lost enclosure.

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ARCHAEOLOGY

Mystery of Cretan Writing Solved as Isle Is Air Base

Deciphering the Minoan Tablets Possible by Relating Them to Ancient Writings of Another Island, Cyprus

WHILE the isle of Crete makes World War history as a British naval and air base for Mediterranean battles, scientists who can still work at peaceful problems here in America report news of reading the mystery writing of ancient Crete.

When archaeologists rediscovered the amazing ancient civilization on this island some years ago, they were baffled by its writing. In the Palace of Minos and other ruins lay quantities of clay tablets quite unreadable. Evidently the bookkeeping files of the Minoan government, said language experts. Eagerly, they pointed out recognizable pictures of grain, of chariots, animals, men, children and deduced that these were official records of government property.

The Minoan, or Cretan, writing, experts further deduced, must have begun with picture signs about 2000 B. C. and then was simplified until about 1700 B. C. it became a convenient running script of about 40 characters. Beyond such deductions, the government records of a nation that once was an international power have remained wiped out of history.

But by a process that sounds like an Edgar Allan Poe cipher tale, or a wartime code expert's reasoning, a number of words of the lost Cretan writing can now be read. Dr. John Franklin Daniel of the University Museum, University of Pennsylvania, tells how it is being done.

Deciphering the Minoan tablets, says Dr. Daniel, is possible by relating them to ancient writings of another Mediterranean island, Cyprus. About 1450 B. C., people of Cyprus borrowed forms of letters from Crete for their own writing. This produced a hybrid Cypro-Minoan writing, which has been coming to light on storage jars unearthed in ruins on the island of Cyprus. Many of these inscribed jars shed brand-new light on the ancient language mysteries.

In time, this Cypro-Minoan script evolved in Cyprus into what language scholars call classic Cypriote writing. This latter is not mysterious, having been deciphered years ago.

So, the experts are now working backward from this well-known classic writing of Cyprus' people to trace as many

signs as possible back to forms they had in Crete.

Significant and helpful are such discoveries as that the early Cyprus language had no w, x, y, or z. Also, it made no distinction between such sounds as b, p and ph, or between t, d, and th, and consequently had only one sound in such groups.

Sound values of about one-third of the Minoan, or Cretan, writing signs are now determined, says Dr. Daniel. Using these as a key, a good many of the Minoan words are now readable, bringing the day nearer when the economics and government accounting of an ancient world power will be far better understood.

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MEDICINE

Skin Test for Pregnancy Gives Answer in One Hour

ASKIN test which tells within less than an hour whether or not a given woman is going to become a mother was announced by Dr. Frederick H. Falls, Dr. V. C. Freda and Dr. H. H. Cohen, of the University of Illinois College of Medicine.

The test is similar to those made for allergy or hayfever. It is said to be 98% reliable. Previously developed tests for early pregnancy take, according to reports of them, from 18 hours to two days. The widely used Ascheim-Zondek test takes two days for a verdict.

In the test developed at the University of Illinois, colostrum is used. This is a watery liquid secreted in the breasts during pregnancy until milk formation starts after the baby is born. A tiny amount of this is injected by hypodermic needle into the skin of the forearm. If the woman being tested is pregnant, there is no reaction. If she is not pregnant, a reddish area of one or two inches diameter appears within an hour around the injection point, disappearing within about five hours.

Besides the speed and economy of the new test, it is said to be valuable because it helps to differentiate between pregnancy and abdominal tumor and also helps to determine quickly the dangerous condition in which the baby starts developing outside the uterus.

Another rapid skin test for early pregnancy has previously been announced by Dr. G. C. Gilfillen and Dr. W. K. Gregg of Dayton, Ohio. In this test a hormone is injected under the skin.

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Battling Bindweed

SOYBEANS, newest major addition to American farm crops, have been enlisted for the war on weeds by Prof. A. L. Bakke of Iowa State College, Ames, Iowa. The enemy under attack is the European bindweed, alias Creeping Jenny, one of the worst pests with which Midwestern and Western farmers have to contend. It is a species of wild morning-glory that forms dense tangles on the ground and strangles almost any crop that the farmer tries to grow. Bindweed in the field constitutes valid reason for refusal of a loan, in many communities.

Prof. Bakke's method of attack is not a blitzkrieg but a siege. It takes five years, but at the end of that time the enemy is completely wiped out.

First step in the siege operations is ordinary fall plowing. Then, in early spring, the soil is worked with a duck-foot cultivator, and in June comes a second plowing, burying the bindweed shoots under six or eight inches of soil. After this, the field is leveled off and the soybeans drilled in, thick and solid. Before the buried bindweed shoots can work their way to the surface the beans are up and growing, and they keep the lead all season, never letting the sun get down to the struggling weeds.

Bindweed roots tremendously deep—

sometimes 15 or 20 feet into the soil, with great reserve stocks of food in thick tubers. So the treatment has to be kept up until the weed's reserves are all gone—usually a matter of five years. However,

the soybeans pay their own way and something over, so that the farmer does not lose money while he is conducting his siege operations.

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INVENTION

Improved Submachine Gun, Anti-Aircraft Weapon Patent

Ordinary Machine-Gun or Rifle Cartridges Can Be Fired in Simultaneous Volley from Parallel Barrels

A NEW submachine gun, firing pistol cartridges like those used in the familiar "Tommy gun" but differing from it in many other respects, is among the crop of recently invented weapons registered at the U. S. Patent Office (U. S. Patent 2,231,978).

The cartridges are fed upwards from a box magazine situated beneath the weapon, instead of from a circular drum as in the "Tommy gun." These magazines are quickly interchangeable. Immediately to the rear of the magazine is an empty box, into which spent cartridge cases are ejected, instead of being thrown out into the open. This facilitates collection of empties for reloading.

The inventor, Harold Wesson of Springfield, Mass., calls attention to the cylindrical shape of almost all of the major parts of the weapon. This means that they can be produced by lathe turning, thus greatly speeding up possible rate of production. Rights in the invention have been assigned to the well-known arms firm of Smith and Wesson, Inc.

An anti-aircraft weapon using ordinary machine-gun or rifle cartridges but firing them in a simultaneous volley from a large number of parallel barrels instead of in the rapid successive fire of the conventional machine gun, is the subject of patent 2,231,879, granted to Frederick J. Brightman of Honolulu.

As illustrated in his patent application, the weapon consists of 36 barrels arranged in a circular bundle, but other numbers and arrangements are possible. Cartridges are fastened to a base plate, which is slipped into place and locked, and then all firing pins are driven forward simultaneously by suitable mechanism. The bullets thus speed on their way like a magnified shotgun charge,

so that if any hits at all are scored there are likely to be a good many of them.

This weapon is reminiscent of one of the earliest forms of machine guns, the mitrailleuse, used by the French against the Prussians in the War of 1870. For use against ground troops, however, sweeping fire was found more effective, so that the successive-shot types of machine gun, developed by many inventors, eclipsed the mitrailleuse.

Science News Letter, March 22, 1941

ASTRONOMY

New Invention Helps In Finding Constellations

FINDING the constellations is easy with a new invention. You turn a drum to the group you want to find, and set an index to a number there indicated. Then a small pointer shows you just where it is. It really operates like a miniature equatorial telescope. (Patent 2,231,071, Thomas T. Harvey, Denver, Colo.)

Science News Letter, March 22, 1941

ESSAYS ON THE NEW VORTEX ATOM

by Carl F. Krafft

The author contends that much confusion has resulted from the failure of physicists to clearly specify whether their atomic models are supposed to represent physical reality, or merely symbols or analogies. Sir Arthur Eddington tells us that the physicist has not yet found the real atom. There are many reasons why the nucleated atom with its peripheral electrons cannot possibly represent physical reality, but thus far not a single reason has been presented why the new vortex atom cannot represent physical reality.

Free upon request

C. F. Krafft, 2510 Q St. N. W., Wash., D. C.

RADIO

Dr. Willis Haviland Carrier, of the Carrier Corp., known as the "Father of Air Conditioning," will tell how air conditioning is helping to solve one of the nation's most pressing problems—need for iron and steel—as guest scientist with Watson Davis, director of Science Service, on "Adventures in Science," over the coast to coast network of the Columbia Broadcasting System, Thursday, March 27, 3:45 p.m. EST, 2:45 CST, 1:45 MST, 12:45 PST. Listen in on your local station. Listen in each Thursday.

•First Glances at New Books

BIOLOGY

MAN STANDS ALONE—Julian Huxley—*Harper*, 297 p., \$2.75. Delightful scientific discussions of man as an inhabitant of this world written by the English biologist. There is much that is pertinent to the striving toward scientific understanding of our disordered world.

Science News Letter, March 22, 1941

GEOGRAPHY—ECONOMICS

FINLAND FOREVER—Hudson Strode—*Harcourt, Brace*, 443 p., illus., \$3.50. A very pleasant way of becoming better acquainted with the remarkable Finns and their remarkable country is provided in this travel book. The author strides over a great deal of ground, showing the reader significant sights, presenting Finnish characters in action, from Sibelius to a patriarch of the old school, explaining history and economics. The photographs are an added attraction.

Science News Letter, March 22, 1941

EDUCATION

TRUE COMICS, First issue — *Parents' Institute, Inc.*, bi-monthly, 64 p., of comics, 10c per copy, 60c per year. The first educational magazine ever published in the popular "comic" format so attractive to children. Its 64 colored picture-pages portray exciting events of present and past history.

Science News Letter, March 22, 1941

EDUCATION

FIFTY HINTS FOR TEACHERS OF VOCATIONAL SUBJECTS—M. R. Bass—*American Technical Soc.*, 46 p., mimeographed, 50c.

Science News Letter, March 22, 1941

BACTERIOLOGY—PUBLIC HEALTH

THE BACTERIOLOGY OF PUBLIC HEALTH—George M. Cameron—*Mosby*, 451 p., illus., \$3.50. The author, Associate Professor of Bacteriology at the University of Tennessee, presents his material simply and clearly, incorporating only those descriptions of symptoms and processes of disease which are of definite value in understanding the infecting organism. Footnotes citing source books are listed more fully in a bibliography at the end of the book.

Science News Letter, March 22, 1941

MUSEUMS—EDUCATION

YOUTH IN MUSEUMS — Eleanor M. Moore—*Univ. of Pennsylvania Press*, 115 p., illus., \$2. There are wonderlands for

children in many American and Canadian cities, "little museums for young moderns" as one such collection of exhibits is called in Kansas City. This is a useful survey and study of what these museums do and how they do it. It will be appreciated by anyone who has the privilege of working with children.

Science News Letter, March 22, 1941

GENERAL SCIENCE

USING OUR WORLD — S. R. Powers, E. F. Neuner, H. B. Bruner and J. H. Bradley—*Ginn*, 626 p., illus., \$1.76. The third of a series of texts for grades seven, eight and nine, written by the same authors. This heavily illustrated volume accents how man controls and uses his environment. The five units are devoted to the living resources of earth, mineral treasures, putting energy to work, the preservation of health, and the conservation of wealth.

Science News Letter, March 22, 1941

TECHNOLOGY

PACKAGING CATALOG, 1941 — *Breskin Pub. Corp.*, 585 p., illus., \$2.50. One of America's most informative books, containing samples of the many materials used in packing the millions of pieces of American merchandise. This is the handbook of the packaging industry and gives technical and trade information on paper containers, transparent containers, wrappings, ties, bags, metal containers, glass bottles and jars, labels, seals, tags, etc.

Science News Letter, March 22, 1941

CHILD STUDY

WOLF CHILD AND HUMAN CHILD; A Narrative Interpretation of the Life History of Kamala, the Wolf Girl — Arnold Gesell—*Harper*, 107 p., illus., \$2. See page 182.

Science News Letter, March 22, 1941

BOTANY

TROPICAL AMERICAN FERNS—Edwin Bingham Copeland—*Univ. of Calif. Press*, 20 p., 66 pl., \$1.

Science News Letter, March 22, 1941

PHYSIOLOGY

MUST WE GROW OLD?—Barclay Newman—*Putnam*, 269 p., \$2.50. A popular discussion of senescence, its causes and possible means of prevention, based largely on recent developments in hormone and vitamin research.

Science News Letter, March 22, 1941

NATURAL HISTORY

WILLIAM BYRD'S NATURAL HISTORY OF VIRGINIA, Or the Newly Discovered Eden—Richmond Croom Beatty and William J. Mulloy, eds. and trans.—*Dietz Press*, 109 p., \$4. A little known classic of early Colonial days in the South, consisting of the natural history notes of a planter who was also a keen naturalist, and who recorded data that would otherwise have quite disappeared. Oddly enough, they were not published first in English, but in a German translation by one Samuel Jenner. Rendered back into the original language, they form the basis of the present volume, which contains also a reproduction of Jenner's German text.

Science News Letter, March 22, 1941

AERONAUTICS

THE AVIATION MECHANIC—Carl Norcross and James D. Quinn—*Whitely House*, 563 p., illus., \$3.50. A timely work that gives a comprehensive treatment of the construction and maintenance of airplanes of every type, military and civil.

Science News Letter, March 22, 1941

MEDICINE

THE WONDER OF LIFE, How We Are Born and How We Grow Up—Milton I. Levine and Jean H. Seligmann—*Simon and Schuster*, 114 p., illus., \$1.75. A simple, clear and unemotional book written to tell children between the ages of about 10 and 14 years how babies come.

Science News Letter, March 22, 1941

ZOOLOGY—ENTOMOLOGY

COELENTERATES COLLECTED ON THE PRESIDENTIAL CRUISE OF 1938—Elisabeth Deighmann—*Smithsonian Inst.* 17 p., 1 pl., 10c.

ACARINA COLLECTED ON THE PRESIDENTIAL CRUISE OF 1938—G. W. Wharton—*Smithsonian Inst.*, 8 p., illus., 5c.

EUPHAUSIACEA AND MYSIDACEA COLLECTED ON THE PRESIDENTIAL CRUISE OF 1938—W. M. Tattersall—*Smithsonian Inst.*, 7 p., illus., 5c. (Misc. Coll., Vol. 99, Nos. 10, 12 and 13)

Science News Letter, March 22, 1941

ENTOMOLOGY

THE MALE GENITALIA OF HYMENOPTERA—R. E. Snodgrass—*Smithsonian Inst.*, 86 p., 33 pl., 50c. (Misc. Coll. Vol. 99, No. 14).

Science News Letter, March 22, 1941